

GE Aircraft Engines
Specification

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INACTIVE FOR NEW DESIGN

*REVISIONS, EXCHANGES & DISTRIBUTION
APPLICABILITY OF COMMODITY, SERVICE, AND
ADVICE TO PURCHASER, CONTRACTOR, AND
SUBCONTRACTOR. PERIODIC INSPECTION, OTHER
PROCEDURES SHALL BE REFERRED TO
INFORMATION PROVIDED IN APPENDIX
MA-2000.*

FATIGUE TUMBLING OF COMPRESSOR BLADES AND VANES

1. SCOPE

1.1 **Scope.** This specification establishes the requirements for tumbling of compressor blades and vanes for the purpose of improving fatigue strength.

1.1.1 **Classification.** This specification contains the following class(es). Unless otherwise specified, the requirements herein apply to all classes.

CLASS A

1.2 **Definitions.** For purposes of this specification, the following definitions shall apply:

Purchaser - The procuring activity of GE Aircraft Engines (GEAE) that issued the procurement document invoking this specification. When this specification is invoked by a U. S. Government purchasing activity (or such activity's designee) the Purchaser shall mean such activity or designee as the case may be.

Supplier - Source other than GE Aircraft Engines (GEAE) who provides material, parts or services, for incorporation into GEAE products.

1.3 **Regulated Materials.** The requirements of P2TF1, CL-A, shall be complied with. The material(s) shown below were referenced in this specification and P2TF1, CL-A, as of the date of this specification issue. The list below does not include all materials which are referenced in sub-tier documents.

There are no referenced materials.

REVIEWED <i>J. Helle</i>	REVISED AVONDALE	REVIEWED LYNN
PREPARED <i>R. McGettigan</i>	APPROVED <i>J.L. McCabe 7/17/97</i>	REVISION NUMBER 10A

GENERAL ELECTRIC
CINCINNATI, OHIO 45218

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2. APPLICABLE DOCUMENTS

2.1 Issues Of Documents. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue shall apply.

GE AIRCRAFT ENGINES SPECIFICATIONS

P2TF1 Regulated Materials

3. REQUIREMENTS

3.1 Process Sheets. The Supplier shall have documented instructions defining the equipment, materials, and operating parameters for processing parts in accordance with this specification.

3.1.1 Technical Plan. A technical plan shall be established by the Supplier or source and approved by the Purchaser before fatigue tumbling of parts. Changes to the approved technical plan shall not be made without prior Purchaser approval. The following items, as a minimum, shall be approved by the Purchaser before initial use.

- (a) Equipment type(s)
- (b) Tumbling media: abrasive type, size, and all chemical compounds
- (c) Equipment settings or output readings for controlling all rotational speeds
- (d) Tumbling time
- (e) Load limits: media and parts
- (f) Procedure for conformance to appearance requirements

3.2 Tumbling Equipment. The tumbling equipment shall be constructed and arranged to permit uniform, repeatable, and controlled operation.

3.3 Tumbling Media

3.3.1 Surface Contact. The media configuration shall be such as to allow contact with all surfaces for which fatigue tumbling is required.

3.3.2 Media Material. The media shall be non-abrasive with respect to the part surfaces such that the requirements of completed part condition are met.

3.3.3 Media Material Effects. The media material shall not produce any detrimental surface conditions on the blade or vane, such as creating sites susceptible to corrosion.

3.3.4 Cosmetic Ingredients. The media may include additional agents to achieve a desired cosmetic appearance.

3.4 Tumbling Process Requirements

3.4.1 Tumbling. Parts shall tumble freely through the media during process operation.

3.4.2 Part Contact. The process shall be controlled so that parts are not damaged by contact with other parts.

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3.4.3 Completed Part Condition. All dimensional and finish requirements shall be met after tumbling.

3.5 Acceptance

3.5.1 Appearance. There shall be visual evidence of tumbling on 100 percent of all applicable surfaces.

3.5.2 Machining Marks. Machining marks from prior processes shall be either obliterated, or completely burnished at both peaks and valleys.

3.6 Fatigue Strength. Fatigue strength shall be demonstrated on representative parts in accordance with 4.1 when specified on the drawing.

3.7 Manufacturing And Inspection Sequences. Fatigue tumbling shall be performed after completion of all thermal treatments, metal removal (except tip grinding), plastic deformation (except peening), and fluorescent penetrant inspection or magnetic particle inspection.

3.7.1 Alternative Processing. Parts that require local metal removal of fatigue tumbled surfaces may be glass bead peened in the affected areas in lieu of a repeat fatigue tumbling when approved by the Purchaser.

3.7.2 Surface Coated Parts. Fatigue tumbling may be performed on parts with surface coatings such as electroplating, plasma sprayed coatings, and organic coatings, provided that fatigue tumbling is not required in the coated areas, and provided that the coated areas are not damaged by the tumbling operation.

3.7.3 Bare Metal Surfaces. Bare metal surfaces which do not require fatigue tumbling need not be masked against the tumbling operation, provided that dimensional and surface finish limits are maintained.

4. QUALITY ASSURANCE PROVISIONS

4.1 Fatigue Strength. Fatigue strength shall be determined by bench fatigue testing of parts in accordance with a procedure approved by the Purchaser.

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